

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A paper quality improver for papermaking, comprising a copolymer (A) having a constituent unit derived from at least one nonionic monomer having a solubility parameter of  $20.5 \text{ (MPa)}^{1/2}$  or less and a constituent unit derived from at least one anionic or cationic monomer, and a surfactant (B) at an (A)/(B) ratio in the range of 99/1 to 1/99 (weight ratio), the quality improver providing at least one paper quality improving effect of the followings (i), (ii), and (iii):

(i) standard improved bulky value:  $0.02 \text{ g/cm}^3$  or more;

(ii) standard improved opacity: 1.0 point or more; and

(iii) standard improved brightness: 0.5 point or more;

wherein the copolymer (A) further comprises a constituent unit derived from at least one nonionic unsaturated monomer having a solubility parameter of  $26.6 \text{ (MPa)}^{1/2}$  or more; and

wherein, as the contents of the constituent monomers, the copolymer (A) comprises:

5 to 84% by weight of the nonionic monomer having a solubility parameter of  $20.5 \text{ (MPa)}^{1/2}$  or less,

1 to 80% by weight in total of the anionic monomer and the cationic monomer, and

15 to 94% by weight of the nonionic unsaturated monomer having a solubility parameter of  $26.6 \text{ (MPa)}^{1/2}$  or more;

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Reply to Non-Final Office Action of January 22, 2007

wherein the surfactant (B) is a water-soluble alcohol alkylene oxide adduct containing an alkylene oxide group having 2 to 4 carbons in an average amount of 5 to less than 150 moles per 1 mole of the alcohol; and

wherein the paper quality improver provides a paper quality improver effect of a standard improved ratio in burst index of  $\geq 502$  or more.

2. (Currently Amended) A paper quality improver for papermaking, comprising a copolymer (A) having a constituent unit derived from at least one nonionic unsaturated monomer having a solubility parameter of  $20.5 \text{ (MPa)}^{1/2}$  or less and a constituent unit derived from at least one anionic or cationic monomer, and a surfactant (B) at a rate in the range of (A)/(B) of 99/1 to 1/99 (weight ratio), the quality improver providing at least one paper quality improving effect of the followings (i), (ii), and (iii):

(i) standard improved bulky value:  $0.02 \text{ g/cm}^3$  or more;

(ii) standard improved opacity: 1.0 point or more; and

(iii) standard improved brightness: 0.5 point or more;

wherein the copolymer (A) further comprises a constituent unit derived from at least one nonionic unsaturated monomer having a solubility parameter of  $26.6 \text{ (MPa)}^{1/2}$  or more; and

wherein, as the contents of the constituent monomers, the copolymer (A) comprises:

5 to 84% by weight of the nonionic unsaturated monomer having a solubility parameter of  $20.5 \text{ (MPa)}^{1/2}$  or less,

1 to 80% by weight in total of the anionic monomer and the cationic monomer, and

15 to 94% by weight of the nonionic unsaturated monomer having a solubility parameter of  $26.6 \text{ (MPa)}^{1/2}$  or more;

wherein the surfactant (B) is a water-soluble alcohol alkylene oxide adduct containing an alkylene oxide group having 2 to 4 carbons in an average amount of 5 to less than 150 moles per 1 mole of the alcohol; and

wherein the paper quality improver provides a paper quality improver effect of a standard improved ratio in burst index of  $\sim 502$  or more.

3-5. (Cancelled)

6. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein one of the constituent monomers of copolymer (A) further comprises a crosslinkable constituent monomer.

7. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the HLB of the surfactant (B) is in the range of  $\sim 5$  to 15.

8-10. (Canceled)

11. (Previously Presented) The paper quality improver for papermaking according to claim 1, further comprising a water-soluble polymer (C) having at least one of a weight-average

molecular weight of 1000 to 10,000,000 and a viscosity at 25°C in an 1% aqueous solution of 1 to 4,000 mPa·s.

12. (Previously Presented) The paper quality improver for papermaking according to claim 1, exerting the effect of a standard improved ratio in burst index of -3,000 or more.

13. (Previously Presented) A process of producing a pulp sheet, comprising the steps of adding the paper quality improver for papermaking according to claim 1 to pulp in any step before a papermaking step and papermaking the pulp at a papermaking speed of 200 m/min or more.

14. (Previously Presented) A pulp sheet comprising the paper quality improver for papermaking according to claim 1.

15. (Cancelled)

16. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the content of the nonionic monomer having a solubility parameter of 20.5 or less in the monomer composition of the copolymer (A), is 15 to 60% by weight.

17. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the content of the nonionic monomer having a solubility parameter of 20.5 or less in the monomer composition of the copolymer (A), is 20 to 50% by weight.

18. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the weight ratio (A)/(B) of the copolymer (A) to the surfactant (B) is 85/15 to 15/85.

19. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the weight ratio of the copolymer (A) and surfactant (B) to the water-soluble polymer (C), which is [copolymer (A) + surfactant (B)]/[water-soluble polymer (C)], is 98/2 to 20/80.

20. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the copolymer (A) has a weight-average molecular weight of 10,000 to 2,000,000, as determined when using polyethylene glycol as a standard sample in GPC (gel permeation chromatography).

21. (Cancelled)

22. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein the mixture of the copolymer (A) and the surfactant (B) is water-soluble.

23. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein said at least one nonionic unsaturated monomer having a solubility parameter of  $26.6 \text{ (MPa)}^{1/2}$  or more is acrylamide.

24. (Previously Presented) The paper quality improver for papermaking according to claim 1, wherein said nonionic monomer having a solubility parameter of  $20.5 \text{ (MPa)}^{1/2}$  or less is a monomer selected from the group consisting of alkyl (meth) acrylic acid of 1 to 40 carbons, vinyl alcohol of 1 to 40 carbons, alkyl-modified (meth) acrylamides of 2 to 40 carbons, alkoxy-modified (meth) acrylamides of 2 to 40 carbons, mono-alkyl esters of maleic acid of 1 to 40 carbons, di-alkyl esters of maleic acid of 1 to 40 carbons, mono-alkyl esters of fumaric acid of 1 to 40 carbons; di-alkyl esters of fumaric acid of 1 to 40 carbons, styrene, vinyltoluene,  $\alpha$ -methylstyrene, ethylene, propylene, butadiene, polyalkylene glycol (meth) acrylates, alkoxy polyalkylene glycol (meth) acrylates, polyalkylene glycol alkenylethers and alkoxy polyalkylene glycol alkenylethers.